MINING AND PETROLEUM STANDARD

AND

AMERICAN GAS-LIGHT JOURNAL.

Devoted to Mining, Petroleum, Gas, Water Supply, and Scientific Subjects Generally.

PUBLISHING OFFICE NO. 22 PINE STREET.

VOLUME VIII—No. 19.
WHOLE No. 175.

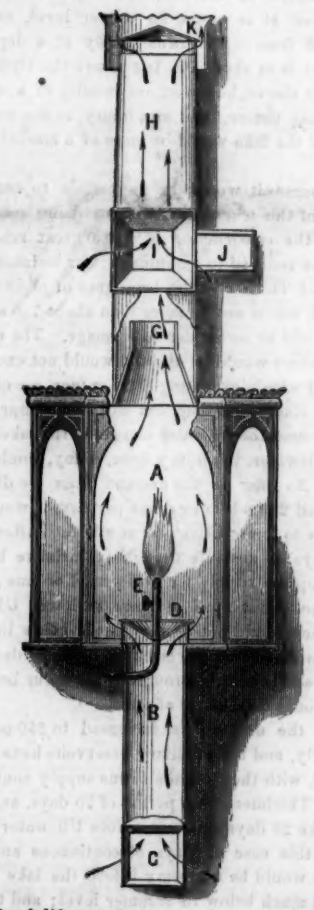
NEW YORK, TUESDAY, APRIL 2, 1867.

$3 PER ANNUM
IN ADVANCE.

Gouge's Atmospheric Ventilator.

"If we breathe a gas that is noxious, or air that contains but a very small proportion of carbonic acid, we die."—PROFESSOR J. C. DRAPER.

The great importance of having a proper ventilation to our dwellings, public halls and institutions, as a conservative to health and longevity, is too well understood by the public generally to require argument. Nothing can compensate to the human economy for the want of plenty of air. The want of it is a positive poison to the system, the deleterious effects of which no medicine can neutralize or prevent.



All animal life requires a certain amount of oxygen to support life. Domestic animals require this life-giving principle quite as much as man. Hence the necessity to have the buildings in which they are kept supplied with a free circulation of pure air at all times. The importance of this subject was fully discussed in the last number of this Journal.

The accompanying illustration will give an excellent idea of Gouge's new system of ventilation, which can be adapted to any case.

A is a glass lantern; B, suction pipe or flue; C, opening in flue, near the floor, for the admission of air and carbonic acid gas; D, diaphram for regulating the admission of air to the gas jet; E, gas pipe and gas jet; G, interior flue for concentrating the heated air; H, ascending portion of ventilating flue; I, apertnre in flue for admission of heated and vitiated air; J, register for opening or closing the aperture I; K, weather cap.

The arrows indicate the up-moving currents of air.

The combustion of the gas jet at E is supported by the air which enters at C; and along with this air, which acquires a powerful ascensional force through the heat of the lantern, the heavy carbonic acid gas also ascends and mingles with the heated air and lighter noxious gases which enter the ventilator at I, all passing upward and onward, by virtue of an irresistible motive power, until they are finally discharged into the atmosphere.

This apparatus may be seen, and further information obtained, at the office of the inventor, H. A. Gouge, 254 Broadway, New York.

The Origin of Carburets and Combustible Material—A New Theory.

Although those combustible materials which obviously result from the transformation of organic matter admit of ready explanation, there are others which are not so produced, as the carburets observed in the products of volcanic eruptions, and such as have been detected by M. Daubree in meteorites. These require some other explanation. M. Berthelot, of Paris, who has been making some scientific researches into the nature and composition of hydro-carbons, has recently made the important discovery that at high temperatures various hydro-carbons will combine with each other, and with hydrogen to form carbides of hydrogen. This discovery has suggested to him a new theory of the origin of petroleum. Daubree has speculated that the alkaline metals may exist in the free state in the center of the earth. Carbonic acid, M. Berthelot states, is everywhere infiltrated in the crust of the earth, and may come in contact with the alkaline metals at very high temperatures. In this way acetylides would be formed. The same acetylides, he states, would also be formed by the contact of alkaline metals with earthy carbonates below, even at a dull red heat. By the action of steam the alkaline acetylides so produced would set free acetyline, and this body being unable to exist under the conditions in which it must be placed, we obtain instead the products of its condensation—bodies allied to petroleum and bitumen. This view of the formation of the natural carbides of hydrogen, by purely mineral reactions, will no doubt attract much attention from chemical geologists. While speaking of the carbides of hydrogen, we must not omit to mention the discovery by Mr. Schorlemmer, of a new series in that still unexhausted mine of discovery, coal tar. These lodes are still under investigation, and will probably be referred to on another occasion.—*Scientific Press.*

The Cincinnati city council has passed an ordinance providing for the purchase of the gas works in the city.

Jones & Collins Aero Gas Heater and Burner.

Gas, as a heating agent, is being so generally used for its convenience, cleanliness and economy, that the attention of inventors has been turned to devising the best apparatus to properly consume the gas, so as to obtain the greatest amount of heat with the least amount of gas. A given volume of coal gas (carburetted hydrogen) requires a given volume of oxygen or atmospheric air to support its combustion, and fully consume it; then all the caloric will be developed that it is possible to obtain.

Herewith is an engraving giving a clear idea of a very neat and simple apparatus for this purpose. Its utility will be at once apparent. It is used chiefly for glue-kettles, hot water boilers, oyster saloons, the sick chamber or nursery; for jewellers, artists, photographers, etc. The burner is to be attached to any convenient gas pipe or fixture. The gas should be lighted at the top of the burner, and the screw at the bottom opens or closes the air-holes, and regulates the amount of air necessary to fully oxidize or consume the gas at the top.

William Jones, 19 Washington street, Boston, and 56 Park street, Chelsea, Mass., manufactures this burner, from whom further information may be obtained.

—The success of the Atlantic telegraph has, we are informed, led to the revival of several schemes for establishing telegraphic communication by other routes. Arrangements are nearly completed for commencing at once the manufacture at Liverpool, of the cable intended to be laid for the North Atlantic route by way of Iceland and Greenland. The prospeccus of the new company will, it is said, be issued immediately.

—Mr. S. Wilmot, of Newcastle, C. W., claims to have established the feasibility of propagating salmon 1,000 miles inland from the sea, and belives the means are within reach of replenishing the great interior rivers and lakes to almost any extent.

The Process of Roasting Ores.

Translated from the German of F. Plattner, for the MINING & PETROLEUM STANDARD AND AM. GAS-LIGHT JOURNAL, by

J. H. TIEMANN.

[Entered according to an Act of Congress, in the year 1866, by Bryant, Callender & Co., in the Clerks Office of the District Court of the United States, for the Southern District of New-York.]

NUMBER XIV.

That there is no appreciable loss of gold in testing auriferous silver ores, I have had abundant opportunity of proving as a practical assayer from the year 1826 to 1829. The royal bureau of mining at Freiberg entrusted me at that time with testing all the gold and silver ores delivered at the works, for the purpose of ascertaining which of them were rich enough in gold to be smelted, and I again tested them after smelting. Altogether 2,560 cwt. of pyritious ores were delivered at the works, containing 650 marks 5 loth (a mark is 8 ounces, a loth ½ ounce) of auriferous silver, the ores were divided into 110 charges. In order to ascertain directly the amount of gold, I took one pound of dry ore from each charge, and roasted it carefully in a sheet iron pan lined with fire-clay, I then mixed it with granulated lead free from gold, and smelted it for two hours with a suitable flux in a bessian crucible, the resulting lead button which sometimes contained portions of matte (from the sulphides) was scorified, and the lead cupelled, the resulting auriferous silver was parted by treating it with nitric acid, and the remaining gold smelted to a button by cupelling it with a little lead. The amount of gold in the 2,560 cwt. of ore was 1 mark, 4 loth, 13.5 grains (12 oz. 13.5 grains). After the ores had been smelted at the works, I parted the auriferous silver and obtained 1 mark, 4 loth, 4.5 grains (12 oz. 4.5 grains) of fine gold, showing a loss in smelting and roasting of only nine grains, which is as near the assay as one could desire.

Deportment of quicksilver in roasting mercurial ores.

When the ores contain sulphide of quicksilver, as cinnabar, liver ore, etc., intermixed or chemically combined, such as gray copper ore with quicksilver, it is converted into gaseous sulphuric acid and vaporous quicksilver, because quicksilver is not oxidized at a roasting temperature, and if oxyd of quicksilver is present it is converted into oxygen and vaporous quicksilver. For this reason it is possible to recover the metallic quicksilver in properly constructed condensing chambers (these will be described hereafter).

It is very different, however, when the quicksilver is combined with chlorine. The chloride and subchloride of quicksilver volatize below a glowing heat without previously smelting; both compounds, however, yield their chlorine more or less completely to many metals and sulphides, and the quicksilver either volatizes completely in the metallic state, or as subschloride or sulphide, chloride of mercury is decomposed most completely by the anhydrous fixed alkalies, or alkaline earths.

Respecting the chemical reactions which occur when pulverized sulphurets or their compounds are roasted in a reverberatory furnace.

If we combine the results of the foregoing experiments on the formation of sulphuric from sulphurous acid, with the well known facts of the changes which occur when sulphurets or their compounds are roasted in a reverberatory furnace, it will not be difficult to obtain a clear insight into those changes; and to these may be also added the deportment of sulphurous and sulphuric acid to carbon, and the deportment of carbon and its compounds to oxygen and hydrogen, formed by the combustible products of the fuel. A grouping together of facts like the following, gives everything necessary for a full explanation of all the phenomena which occur in the roasting of sulphurets.

The changes which sulphurous and sulphuric acids undergo in roasting.

SULPHUROUS ACID.

1. Sulphurous acid and oxygen (of the air) form sulphuric acid by contact

2. Sulphuric acid with oxides rich in oxygen changes to sulphuric acid at the cost of the oxides, which are reduced to a lower stage of oxidation.

3. Sulphurous acid alone, in contact with an unchangeable substance, is decomposed to sulphuric acid and sulphur.

4. Sulphurous acid passed over pulverized metals or sulphurets, changes more or less completely to sulphuric acid and sulphur.

5. Sulphurous acid and carbonic acid do not act on one another.

6. Sulphurous acid and carbonic oxyd gas in the atomic proportions of 1 to 2 from carbonic acid and sulphur escapes in vapor. If the proportions vary either carbonic oxyd or sulphurous acid remains in excess.

7. Sulphurous acid and carbon in proper proportions from carbonic acid, setting sulphur free.

8. Sulphurous acid and hydrogen in the atomic proportion of 1 to 2 (hydrogen as double atomic) form steam, setting sulphur free.

9. Sulphurous acid and carburetted hydrogen containing the minimum of carbon (grubengas) in the atomic proportions one to one, form steam and carbonic oxyd gas, while sulphur is set free.

10. Sulphurous acid and carburetted hydrogen containing the maximum of carbon (oleaginous gas) in the atomic proportions 3 to 2 also form steam and carbonic oxyd gas, sulphur being set free.

SULPHURIC ACID.

1. Sulphuric acid when passed over oxides which are inclined to absorb oxygen changes to sulphurous acid, and the oxides are more highly oxidized.

2. Sulphuric acid when passed through a glowing narrow space where it can only come in contact with the surface of the confines (as when passed through a glass or porcelain tube,) changes more or less completely to oxygen and sulphurous acid

3. Sulphuric acid when passed in sufficient quantity over incandescent sulphides which are at a low stage of sulphurization, yields one atom of its oxygen to the substances changing them to oxides at the lowest stage of oxidation combined with sulphuric acid, and is itself changed to sulphurous acid. If the sulphides are at a higher stage of sulphurization sulphur is set free.

4. Sulphuric acid with metals which are inclined to oxidize at a high temperature, yields them a part of its oxygen and changes to sulphurous acid.

5. Sulphuric acid and vapors of sulphur in the atomic proportions 2 to 1, form sulphurous acid. If there was not sufficient sulphuric acid, part of the sulphur remains undecomposed.

6. Sulphuric acid and carbonic acid do not act on one another.

7. Sulphuric acid and carbonic oxyd gas in atomic proportions 2 to 1, form sulphurous and carbonic acid.

8. Sulphuric acid and carbon in atomic proportions 2 to 1, form sulphurous and carbonic acids.

9. Sulphuric acid and carburetted hydrogen in the atomic proportions (with gruben gas) one to one (with oleaginous gas) 3 to 2, form steam and carbonic acid, while sulphur is set free.

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—In Detroit, a new motive power for starting street cars has been invented. It is thus described: A wheel is firmly attached to the centre of the axle. On this a "dog" impinges the moment an attachment intended to draw the car is acted upon. This so rapidly assists in moving the wheels, that the moment they are started the leverage is removed, but immediately on stopping it returns to its original position, and is ready for another start. This attachment and fulcrum are inseparably connected, and must act conjointly. Its simplicity is a principal feature, and cannot fail to commend itself.

—The ties on the Union Pacific Railroad are of cotton wood, burnettized. A boiler one hundred feet in length and five feet in diameter is filled with the ties and the air exhausted. A solution of chloride of zinc is then injected, which fills the pores of the wood, and renders it comparatively indestructible,

On the Future Water Supply of London.

[From the London Journal of Gas Lighting and Water Supply.]

BY GEORGE WILLOUGHBY HEMANS, C. E., AND RICHARD HASSARD, C. E.

[Concluded.]

There would not be any necessity, in the first instance, for constructing the auxiliary reservoirs in Swindale and Martindale, as until the towns supply exceeded 200 million gallons per day, Thirlmere and Ullswater would contain sufficient storage, and would be able, after giving credit for the summer yield, to work up to 135 days supply, whilst compensation water would be given out from Haweswater and from St. John's Beck reservoirs; when the demand exceeds 200 million gallons per day, these auxiliary reservoirs may be constructed, and, if necessary, others in addition, as many sites are available; should the demand eventually exceed 250 million gallons per day, a further area of 53 square miles of collecting ground may be obtained on the southern slopes of the range of hills above Amble side and Kendal, by constructing reservoirs in the valleys traversed by the Troutbeck, the Kent, the Sprint, and the Bannisdale Beck streams, and an additional quantity of about 75 million or 80 million gallons daily may be easily obtained from these sources of supply.

As to the capability of the district, no doubt therefore can exist, and it is worth consideration whether it might not be the wisest course in the first instance to construct those portions of the aqueduct, which cannot be added to from time to time, of sufficient capacity for this extended supply.

The surface of Ullswater Lake would be ordinarily maintained at or about its winter level, and water drawn off from it for towns supply at a depth of 20 feet, that is at about 460 feet above the Ordnance datum; the shores, however, are mostly of a steep and precipitous nature, and any injury to the scenery, or aspect of the lake would be more of a fancied that real nature.

Of course it would be impossible to carry out a scheme of this magnitude without doing some injury, but in the construction of these great reservoirs, it would be reduced to a minimum: for instance, Haweswater and Thirlmere, the total area of additional land required, would not be more than about 750 acres, and there would be no residential damage. The number of houses which would be affected would not exceed 17 or 18, all of which, excepting three or four, are of the most ordinary class; and they can all, if necessary, be re-erected round the extended margin of the lakes.

At Ullswater, the injury done, if any, would be very trivial. As long as the demand from the district did not exceed 200 million gallons per day, it would not be necessary to lower Ullswater at all, until after a period of 67 days of absolute drought; Thirlmere being able to keep up the supply for that period of time; it would then take about 39 days more to lower Ullswater 8 feet, which would not be very much below its summer level; so that under the circumstances, 97 days of continuous and absolute drought must occur before Ullswater would be sensibly affected.

When the demand has increased to 250 million gallons daily, and the auxiliary reservoirs have been constructed, with their aid the towns supply could be kept up from Thirlmere for a period of 70 days, and it would then take 23 days more to reduce Ullswater 8 feet, so that in this case 93 days of continuous and absolute drought would be necessary before the lake would be reduced much below its summer level; and there is no record of drought of any such duration ever having occurred in this notoriously wet locality.

On this subject we are indebted to Mr. Samuel Marshall, of Kendal, who has been a careful obrerver of the rainfall there since 1822, for the following valuable information:

The longest period of drought in this locality (Kendal) during the last 44 years, occurred in the spring of 1852, which, singularly enough, was also here the wettest year during that period.

From the 19th of February to the 29th of April there

were but three days on which rain fell, and the aggregate fall was only 0.21 inches, being a period of 70 days with less than a quarter of an inch of rain.

The droughts next approaching this in duration occurred as follows:

In 1861, from the 1st of April to the 8th of June—a period of 69 days—there were but nine days in which rain fell, with an aggregate fall of 1.65 inches.

In 1839, from the 28th of March to the 4th of June—a period of 67 days—there were but 12 days on which rain fell, with an aggregate fall of 1.97 inches.

In 1826, from the 28th of April to the 28th of June—a period of 60 days—there were but eight days on which rain fell, with an aggregate fall of 1.12 inches.

In 1828, from the 14th of December to the 8th of February 1830—a period of 55 days—there were but five days on which rain fell, with an aggregate fall of 0.65 inches.

The years 1844, 1853, 1864 and 1865 were also dry years, but with droughts of much shorter duration than those above mentioned.

It must be borne in mind also, that Mr. Marshall's observations relate to the rainfall at Kendal, which in many cases is not more than one-half of that in the mountainous districts above, where there is often a considerable amount of rain, whilst it is fine weather in the low country adjoining.

The water from Thirlmere would be drawn off at its northern extremity, and conveyed to Ullswater by conduit and tunnel; the tunnel would be eight miles in length, but shafts can be put down over the entire distance, and in such a case it is obvious there would be no greater difficulty in constructing a long tunnel than a short one; it is simply a question of greater length and of additional shafts.

From Ullswater the supply would be drawn off from the south end of the lake at Patterdale, and from thence carried by tunnel under Kirkstone Pass.

This tunnel would be the only work of unusual magnitude connected with the project; it would be 7¼ miles in length, but of this, 5¼ miles would be ordinary and rather shallow tunnel, and would therefore present no difficulty; the central portion immediately under Kirkstone Pass would be 1¼ mile in length between the shafts, and would at the rate of progress which has been effected at the Mont Cenis tunnel, occupy in its construction about three years after the shafts were sunk.

No doubt with the rock-boring machines of the present day, it might easily completed in that or a less period of time

From the south end of the tunnel the water would be conveyed to London by conduit, tunnel and iron pipes; the aqueduct would pass by Ambleside and Kendal, and down the eastern side of Lancashire, avoiding the Wigan coal field, to the east of the Staffordshire coal field and of Birmingham, and onward towards London, following a route nearly parallel with that of the London and North Western Railway, and would terminate in a large regulating reservoir to be constructed to the north of Harrow, at a distance of about 12 miles from Cumberland Gate, Hyde Park.

The project may, in fact, be briefly described as an acqueduct, or arterial conduit, deriving its supply from the great rainfall and natural reservoirs of the lake country, passing through the heart of England, and capable of affording, *in transitu*, a practically unlimited quantity of the purest possible water to the vast manufacturing districts and population on the line of its route, as well as to the metropolis itself.

Some portions of the project and of the acqueduct may be carried out in detail, as the demand for water increases from time to time.

We now come to the consideration of the financial part of the scheme

Of late years it has been pretty well recognized that all great projects, of this and similar natures, should be the property of the communities to whom they minister—or, in other words, that the consumers should be the proprietors of their own works, and guardians of their own interests.

It is also equally recognized that the rates for water supply and drainage should be compulsory, and extend to all property within the area benefitted. In different localities the rates are differently apportianed, but the principle is almost universally practiced, and has been adopted in many large provincial cities and towns, with great public advantage; it should, we conceive, *a fortiori*, be extended to the metropolis, and the water supply placed under the control of the Metropolitan Board of Works, or of a similar board to be elected for the purpose from the rate-payers the themselves.

In this case, it would of course be necessary to purchase the existing water works, and incorporate them with the new project, securing to the different companies the net incomes they at present enjoy.

We learn from the pamphlet recently published by Mr. Bateman, C. E., on the water supply of London, that these in the aggregate amount to rather more than £400,000 per annum, whilst their gross receipts are about £700,000, or nearly 1s. in the pound on the present rateable value of property in the metropolis, which amounts to about £15,000,000 annually, and this would no doubt reach to a much larger amount by the time these proposed works were completed. We shall call it, then, £16,000,000, although, judging from the late ratio of increase, this would evidently be below the mark.

The cost of the project complete, for a daily supply of 250 million gallons, we estimate at £12,200,000.

New Mode for Working Silver Ores.

Mr. A. Hunter, the inventor of Hunter's Concentrator, has presented for investigation a cheap mode for working sulphurated silver ores, which is certainly worthy of careful consideration by all persons engaged in silver mining. That quite too large a percentage of loss is unavoidable from the present mode of working low-grade ores, says the *Mining Press*, is universally acknowledged. The only reason assigned for continuing that wasteful mode is the great cost of submitting the entire mass of the ores to the fire process. By a cheap method of concentration, by which only the sulphurets need be roasted, this expense must be materially reduced and a large increased gain realized. The economy of the idea rests wholly in the cost and efficiency of the *concentrator*. Will not some of our enterprising silver workers try Mr. Hunter's plan, and report results? We have long had confidence in such a mode of working both silver and gold ores. It is now being generally adopted by our gold miners, much to their advantage. We see no reason why it may not be made equally as serviceable in silver mining. Mr. Hunter's plan is:

For reducing the ore, use the ordinary battery and a No. 6 screen; concentrate in front of the battery, and as the sand passes off from the tables, pass it over a fine screen of No. 80, or 6,400 meshes to the square inch. The water and slum pass through the screen, and are run into tanks and settled. The only machinery necessary for the above process is the ordinary battery, concentrators, and a few amalgamators for working the slum. The sulphurets of ordinary silver ores, when concentrated, will average about five per cent. or 100 tons will give five tons of sulphurets. The following is about an average cost of reducing, concentrating and working the sulphurets and slum:

For reducing and concentrating 100 tons of ore at $5 per ton	$500 00
For roasting and working five tons of sulphurets at $50 per ton	250 00
For working the slum	50 00
For working 100 tons of ore	$800 00

Making $8 per ton for extracting at least 80 per cent. of the silver contained in the ore as per fire assay, and scarcely any waste of quicksilver. By the ordinary process now in use for low-grade ores, extracting only about 60 per cent. of the fire assay, the cost for working is about $15 per ton; and for high grade ores, where 80 per cent. is guaranteed from the fire assay, the cost is from $35 to $45 per ton. The difference of the cost of working and the cost of machinery is easily calculated, and the thousands of tons of low-grade ores that would not pay to work, will prove highly remunerative for the capital and labor expended by the use of the above process.—*Alpine Miner of Dec.* 8, 1866.

On the Combustion of Gas for Economic Purposes.

A Lecture delivered before the British Association of Gas Managers.

By Dr. Letheby.

(From the London Chemical News, No. 341.)

(Reprinted at Philadelphia in the Journal of the Franklin Institute.)

Heating and Vitiating Effects of Different Illuminating Agents when burning, so as to give the Light of 12 *Sperm Candles.*

	Lbs. water raised 1° Fahr.	Oxygen consumed Cub. feet.	Carb. acid produced Cub. feet.	Air vitiated. Cub. feet.
Cannel gas	1920	3.30	2.01	50.2
Common gas	2786	5.45	3.21	80.2
Sperm oil	2835	4.75	3.33	83.3
Benzole	2326	4.46	3.54	85.5
Paraffin	3619	6.81	4.50	112.5
Camphene	3251	6.65	4.77	119.2
Sperm candles	3517	7.57	5.77	131.7
Wax	3831	8.41	5.90	149.5
Stearic	3747	8.82	6.25	156.2
Tallow	5054	12.00	8.73	218.3

The vitiating effect is calculated on the actual loss of oxygen, and on the power which four per cent. of carbonic acid has on the vital qualities of the atmosphere; and, though the results indicate that there should be less discomfort in a room lighted with coal gas than with any other illuminating agent, yet common experience is altogether in the opposite direction. The explanation of this is to be found not only in the fact that gas is used more lavishly than other agents, but also that in burning it produces a larger proportion of aqueous vapor, which becoming diffused into the surrounding atmosphere, occasions great discomfort. Professor Tyndall has shown that the molecules of aqueous vapor are endowed with a remarkable power of absorbing the radient heat of burning gas, and by thus becoming warm they create a sense of oppression. And again, when the warm atmosphere of a room is overcharged with moisture, it checks the action of vaporous or insensible perspiration, and this also causes distress. In all cases, therefore, where gas is largely used in rooms, provision should be made for the quick removal of the products of cumbustion.

When the heat of gas is required for warming a room, its radient power should be increased by allowing it to ignite some solid substance, for the radient heat of a non-luminous flame is very magnificent. I have here a Bunsen's burner, which gives with this gas the highest temperature of combustion, but the amount of heat which radiates from it is very small—smaller, indeed, than is the case when the gas is burnt in the ordinary way, when every atom of ignited carbon becomes a centre of radiation. The proportion of radient heat from the same flame under different circumstances is very variable. From Bunsen's burner it is only 12, from the same gas burnt as a luminous flame it is 30, and with a spiral platinum in it, is 85. The introduction of solid matter into a non-luminous flame of high temperature changes its character altogether, and from the heat of connection it becomes heat of radiation. No doubt the quality of the vibration is greatly changed, and they pass from the large and comparatively slow undulations of obscure heat to the small and quick vibrations of light; and the more this is affected, the greater and greater becomes the intensity of the radient heat. Professor Tyndall found that the following were the quantities of radient heat from a platinum spiral, at different degrees of luminosity:

	Deg. of heat radiated.
Platinum spiral, feebly red	19
" " dull red	25
" " full red	62
" " orange red	88
" " yellow red	158
" " yellow white	200
" " blue white	276
" " intense white	440

so that when we wish to economise the radient heat of

burning gas, it is best to use it with some solid body, as fragments of pumice or pieces of asbestes.

The last point to which I would refer is the available or convertible motive power of burning gas.

The calculations of Dr. Mayer, of Heilbron, and the experimental inquiries of Mr. Joule, of Manchester, show that the mechanical power of heat is 772 lbs. raised a foot high for the heat necessary to raise the temperature of a pound of water 1° Fahr. A cubic foot of hydrogen in burning has, therefore, the mechanical power of (329 × 772—) 253,988 lbs.; and the same quantity of common gas has the power of (650 × 772—) 501,800 lbs.; while the power of a cubic foot of cannel gas is (760 × 772—) 586,720 lbs., raised a foot high. But if the same quantity of these gases is exploded with air or oxygen in a closed chamber, the mechanical power is somewhat different. I have here tabulated the expansive force of such a mode of combustion, and I may say that the calculations are deduced from the temperatures of combustion and from the volumes of the products, allowance having been made for the specific heats of the several products. It would seem, therefore, that the explosive powers of the several constituents of coal gas, when mixed with their proper proportions of air or oxygen, are as follows:

Explosive power of Mixed Gases.

	Mixed with Air. (Ats.)	Mixed with Ox. (Ats.)
Hydrogen	12.5	25.6
Marsh gas	14.0	37.0
Olefiant gas	15.1	42.9
Propylene gas	22.5	67.3
Butylene gas	30.2	85.8
Carbonic oxide	11.7	21.8
Common gas	14.7	29.2
Cannel gas	18.0	38.8

These are the theoretical pressures exerted upon the sides of the containing vessel when these several gases are exploded, with their proper proportions of air or oxygen; but as the explosion is never instantaneous, but proceeds from particle to particle, and therefore occupies time, and as the walls of a vessel always cool the products of the exploded gas to a great degree, this theoretical value is never obtained in practice, the highest pressnre in the exploding chamber of a gas engine being only 75 lbs. on the square inch, or five atmospheres. The power of this has been determined experimentally by Mr. Evans, who informs me that with a cubic foot of a mixture of nine parts air and one part gas, he has propelled a wooden shot (three inches by four) 50 yards; and he ascertained that the same effect was produced with an ounce of gunpowder. The motive power, therefore, of the exploding mixed gas is considerable.

(To be continued.)

Brevities.

—Two women were burned to death at Eaton Rapids, Ill. They were kindling a fire with kerosene oil.

—The largest oil-cloth factory in the world is in Brooklyn.

—In 1866, the coal exports of Pennsylvania amounted to 12,285,963-17 tons, against 9,581,672-03 in 1865.

—Cast-iron projectiles were first made by the French in 1400.

—There is much distress in the Lehigh and Schuykill coal regions at present, and little is doing at the collieries.

—The earnings of the Oil Creek Railroad for the last year, amount to one million and a half dollars, or equal to $40,000 per mile.

—An explosion took place at the Clover Hill coal pit, Chesterfield county, Virginia, recently. The men escaped injury, but several horses and mules were killed.

—Not less than $300,000,000 in gold and silver have been taken from the wild mountains of the far West within the last five years.

To Whom the Origination of the Venango Petroleum Discovery is Due.

[Concluded.]

The distance between the standard candle and the illuminator sought to be determined was constantly 150 inches—the Photometer traversed the graduated bar in such a manner as to read, at any point where equality of illumination was produced, the ratio between the two lights. I quote only single examples of the average results, and with as little details as possible, but I should state that the operations of the Photometer was so satisfactory, that we obtained constantly the same figures when operating the same way, evening after evening, and the sensitiveness of the instrument was such, that a difference of one half inch in its position was immediately detected in the comparative illumination of the two equal discs of light in the dark chamber. This is, I believe, a degree of accuracy not before obtained by a Photometer.

Table of illuminating power of various artificial lights compared with Judd's patent candles as a unit.

Gas burning in Scotch fish tail tips, 4 feet to the hour	1 : 4.5
Gas burning in Scotch fish tail tips, 6 feet to the hour	1 : 7.55
Gas burning in Cornelius fish tail tips, 6 feet to the hour	1 : 6.2
Gas burning in English Argand burner 10 feet to the hour	1 : 1.6
Rock Oil burning in 1 inch wick, Camphene Lamp, consuming 1¼ ounces fluid the hour	1 : 8.1
Carcel's Mechanical Lamp, burning best Sperm Oil, 2 ounces fluid to the hour, wick ⅞ of an inch	1 : 7.5
Carcel's Mechanical Lamp, burning Colza Oil	1 : 7.5
Camphene Lamp, (same size as Rock Oil above), burning best Camphene, 4 ounces fluid per hour	1 : 1.1
"Diamond Light" by "Sylvic Oil" in ½ inch wick 4 ounces per hour	1 : 8.1

From this table it will be seen that the Rock Oil Lamp was somewhat superior in illuminating power to Carcel's Lamp of the same size, burning the most costly of all oils. It was also equal to the "Diamond Light" from a lamp of one half greater power, and consequently is superior to it in the same ratio in lamps of equal power.

The Camphene Lamp appears to be of one-fifth superior to it, but, on the other hand, the Rock Oil surpasses the Camphene by more than one half in economy of consumption (i. e., it does not consume one half so much fluid by measure), and it burns more constantly. Compared with the Sylvic oil and the Sperm, the Rock oil gave on the ground glass diaphragm the whitest disc of illumination, while in turn the Camphene was whiter than the Rock oil light. By the use of screens of different colored glass, all inequalities of color were compensated in the use of the Photometer, so that the intensity of light could be more accurately compared.

Compared with Gas, the Rock oil gave more light than any burner used, except the costly Argand, consuming ten feet of gas per hour. To compare the cost of these several fluids with each other, we must know the price of the several articles, and this varies very much in different places. Thus, gas in New Haven costs $4 per 1,000 feet, and in New York $3 50 per 1,000; in Philadelphia $2 per 1,000, and in Boston about the same amount.

Such Sperm oil as was used costs $2 50 per gallon, the Colza about $2, the Sylvic oil 50cts., and the Camphene 68 cts.—no price has been fixed upon for the rectified Rock oil.

I cannot refrain from expressing my satisfaction at the results of these photometric experiments, since they have given the oil of your company a much higher value as an illuminator than I had dared to hope.

USE OF THE ROCK OIL AS A LUBRICATOR FOR MACHINERY.

A portion ef the rectified oil was sent to Boston to be tested upon a trial apparatus there, but I regret to say that the results have not been communicated to me yet. As this oil does not gum or become acid or rancid by exposure, it possesses in that, as well as in its wonderful resistence to extreme cold, most important qualities for a lubricator.

CONCLUSION.

In conclusion, it appears to me that there is much ground for encouragement in the belief that your company have in their possession a raw material from which, by simple and not expensive process, they may manufacture very valuable products.

It is worthy of note that my experiments prove that nearly the whole of the raw product may be manufactured without waste, and this solely by a well directed process which is in practice, one of the most simple of all chemical processes. B. SILLIMAN, JR.,

Professor of Chemistry in Yale College.

NEW HAVEN, April 16th, 1856.

The Gold Mines of Downieville, California.

Downieville, once famous throughout California for the richness of her placer mines, is not now the bustling place it was when the virgin bars and banks roundabout were first spoiled of their auriferous treasures. Still Downieville holds her own well. Within or about the place are to be seen few of those indications of decay premonitory of speedy desertion which are but too plainly visible in many once noted mining camps. On the contrary, in every direction are seen the best of indications that the place is about to take a new growth, with a firm foundation and permanent prosperity, in the many rich and extensive veins of gold bearing quartz every where to be seen cropping from the circumjacent hills. True it is that the glory of the once famous "Tin Cup Diggings"—the workers wherein divided the result of their days' labor by measuring out by the pint—has departed; Durgan and Jersey Flats no longer yield their pounds of fine gold, nor the gulches their thirty pound lumps, but we still have the veins from which all this wealth originally came.

Doubtless there are yet cart-loads of gold in the bars and bed and banks of the river, but the nuggets are so scattered, and the paying pockets of fine gold so far between, that they cannot be profitably sought for.

Some day, perhaps, all our old drift diggings will be sluiced from top to bottom, and many spots of unworked ground discovered, whereof we now have but dim and contradictory traditions. But the time for this is most assuredly many years distant. Meanwhile our miners are very wisely turning their attention to the development of the many quartz veins from which the river bed and bars derived their golden stores. Old mines are being re-opened and scientifically timbered, and old mills are being remodeled and plans for new ones discussed; new flumes have been constructed in room of the decayed structures anciently in use, and tunnels are being run to tap at great depths leads formerly worked upon or near the surface by means of shallow shafts and aimless cuts and drifts.

Besides this general rejuvenation much work is being done in newly discovered mines, and in nearly every instance with results decidedly encouraging. Some developments, indeed, have been made, and at but a few feet from the surface, that are quite astonishing. In addition to the many veins of gold-bearing quartz, we have in this vicinity immense beds of cement. A few of these have been tested, and found sufficiently rich to pay handsomely for milling, while of other deposits little is known. One mill at least will be erected during the coming Spring to crush cement, doubtless soon to be followed by others. At the foundry in our town all kinds of mill castings, even to mortars weighing several thousand pounds, are readily turned out. Such additions of machinery have been made that almost everything needed about a quartz mill can be speedily made, thus greatly accomodating mill owners in case of accident to any part of the running gear of their works.

Next season will be one of great activity among our prospectors. Some few capitalists have already made their appearance among us, and have been so well pleased with the prospects of our place as to invest in

various enterprises. This is particularly encouraging to persons who have no capital but their pick, shovel and strong arms. Though they may lack means to develop such leads as they happen to discover, there is nothing to hinder them from selling for a fair price to persons who have the needed capital. In conclusion, we would suggest to our prospectors the propriety of scrutinizing very closely not only all the quartz with which they may fall in with, but also all sorts of decomposed and discolored rock. Some big strikes have of late been made in the southern counties of this State in rock looking like anything but quartz. Talcose slate is often highly auriferous. There are to be seen almost every where in this region hills streaked with soil and rock of nearly every imaginable hue. These streaks are doubtless indications, in most instances, of the presence of metals, therefore worthy of a close examination.—*Downieville Advocate.*

Deodorizing Petroleum and Mineral Oils.

A patent has been taken out by M. Joule, chemist, London, for the employment of dentoxide of nitrogen or nitrous gas in removing the offensive odor of petroleum and other mineral oils. One mode of procuring this is by using nitric or fuming nitrous acid in combination with shreds of iron, copper or other metal. The nitrous gas thus formed is conducted from the outlet by means of a pipe or tube, into a vessel charged with petroleum tobe deodorized, in such a way that this pipe or tube reaches to the bottom of the vessel, thus allowing the nitrous gas to force its way through the whole of the contents. The gas is continued to be generated and forced therein, until fumes of nitrous gas begin freely to escape from the petroleum or oil, thereby indicating its complete saturation. As soon as this has taken place the whole is to be well roused by forcing air through the liquid, or by a suitable agitation, after which the vessel containing the liquid petroleum or oil is to be closed until by testing, the petroleum or products thereof are found free from any disagreeable odor, the time for which will be in proportion to the amount of gas generated and forced therein. Should the temperature be so low as to render the petroleum thick, it should be heated to a temperature of 100° F., and thus liquefying it the deodorization will be more quickly and easily effected. Another modification of this deodorizing process is to pass the nitrous gas during the distillation of petroleum into the upper part of the still, so as to bring the nitrous gas into contact with the vapors arising therefrom. The gas for this purpose is collected in a suitable gas-holder, and by pressure forced into contact with the petroleum vapors, the proportion of gas being regulated by a suitable stop-cock. The nitrous gas in this process may also be used in combination with ordinary or superheated steam, if thought more desirable, As it may be found convenient to effect the deodorization of the crude petroleum in the casks, other means are made use of as follows:—Into a cask, the contents of which are about 40 gallons, there are poured three or four pounds nitric or fuming nitrous acid, and the contents thoroughly roused by means of a suitable agitation, or by forcing air through a pipe to the bottom of the cask. After rousing the contents for about five minutes, there is thrust into the cask containing the petroleum and acid, about two pounds of scraps or filings of iron, which should be previously moistened with water. The iron coming in contact with the acid, nitrous gas is generated, and by saturating the petroleum, deodorization is effected. Should the deodorization be not thoroughly complete, the contents are again roused, more iron and acid being added, until the object is accomplished. The petroleum or other products, while being subjected to the above treatment, and previous to distillation, should have the acid wholly removed or neutralized by decantation and washing with suitable alkaline substances, or by the addition and subsequent agitation of fresh slacked lime in the proportion of 6 pounds of lime to 40 gallons of petroleum. After distillation, the oil is sometimes again subjected to the action of nitrous gas.—*Journal of Applied Chemistry.*

Correspondence.

Detaching Carbon from Retorts.

NEW-YORK, March 23, 1867.

EDITORS AMERICAN GAS-LIGHT AND MINING JOURNAL:

Sirs: The sample of carbon which you saw at our office this week, was taken from a gas retort made by Messrs. J. K. Brick & Co., under the following circumstances:

The chemicals used were put into the retort immediately after drawing the usual charge of coke, and in five minutes the mass of carbon began to cleave off, and in 15 minutes the whole was loose. Owing to the smallness of the mouth of the retort, the carbon had to be cut into two parts by breaking up the flooring of it, which took about two hours. The time occupied from the putting in of the chemicals until the whole was removed from the retort was 2 hours and 25 minutes, when the retort was again charged with coal as usual. This retort had been cleaned by the same process several times during the year. It had been in use since the 7th of June 1856. The weight of carbon taken from the retort, as described above, was 224 pounds. The chemicals do not injuriously effect the retort in any particular, but will prolong the time they can be used, months over any of the usual ways of removing the carbon. Yours, &c.,

E. B. BROWN, & SON,
57 Cedar street, New-York.

Air in Gas.

TERRE HAUTE, Ind., March 25, 1867.

EDITORS AMERICAN GAS-LIGHT JOURNAL:

We were much pleased with the remarks in your last issue on "Air in Gas," in reply to the *Sun*, of your city. We suppose the article in the *Sun* was predicated on one in the Cincinniti *Gazette* of some weeks ago, in which the same idea—"that consumers are paying for atmospheric air, instead of gas"—was advanced: apparently sustained by the following extract from "Muspratt's Chemistry as applied to the Arts and Manufactures," volume 2, page 146, in which was found "conclusive evidence on this point:"

"There has been much discussion and dissatisfaction in Liverpool of late, with regard to the water meter, parties asserting that although the company had lowered the price of gas, still the bills, when they were sent in, were higher than they used to be. So many persons came forward and asserted this that the editor was applied to by Mr. Whitley, of the *Liverpool Journal* to know in what way the above could be accomplished. The following question had to be solved: Is it possible, by manufacturing inferior gas, to compel the meter to register against the consumer?"

In the editor's opinion it is no matter what kind of gas, insoluble in water, is made, the registration would be the same; but if *atmospheric air* was passed into the mains and entered the meter in company with the coal gas, it would tell against the consumer, *and the light emitted would be deteriorated.* Mr. Whitley remarks, in reply to the editor's statements, that experiment performed at the gas works justified them. It appears, by introducing one-tenth of common air into the gas holder, charged with gas, that the meter registers *ten per cent. or more* against the consumer. Some denied that gas so mixed with air would burn; but the result showed that it does, and had no effect visible to the eye, which is an important fact.

On page 163 of the same work the mode of detecting the presence of common air in coal gas is thus described:

"The presence of atmospheric air in coal gas can be readily detected by collecting a portion of the gas over mercury, and then passing up, first a few drops of caustic potassa, and afterward a drop or two of a solution of pyrogallic acid. If the liquid assume a blood red hue, oxygen, indicating the presence of atmospheric air, is mixed with the gas."

In this extract it is plainly seen, that the real trouble with the consumers was about the *meter*, that being in their opinion at fault—not the *quality* of the gas.

The editor, "Muspratt," perceiving at once that the *meter* was not to blame, in reply said, "it is no matter what kind of gas, insoluble in water, passed through the meter, *it* would register the same" Undoubtedly this is true; the meter, one of the most ingenious contrivances of the age, formed in accordance with well established scientific principles, simple in construction, exact in its operation, will pass precisely the quantity per revolution it was designed for, whether gas of 12, 13 or 15 candle power, or from 1 to 12 candle power, or whether "atmospheric air" alone. The meter being a machine and not a chemist, it could not discriminate between good or bad gas passed through it, consequently would measure accurately, "it was no matter what kind of gas, insoluble in water" presented itself. So true is it that when the manufacturers or the gas companies wish to test the accuracy of meters by what is technically called, "proving them," they in nine hundred and ninety-nine cases in one thousand, prove them with *air* at the same pressure, temperature, etc., at which gas is delivered through them to the consumer, instead of gas, as in using that article it would involve considerable expense, without one particle of practical advantage.

Muspratt further says—"but if atmospheric air was passed into the mains and entered the meter in company with coal gas, it would tell (measure just in proportion to the amount of air introduced) against the consumer, *and the light emitted would be deteriorated.*" Not the least question of that fact, if—there is the point—*if atmospheric air is introduced &c.*

Taking your article as a basis (we think it correct, but have no apparatus to verify the accuracy of your statement, therefore assume it to be so), it will be at once seen, as you observe, how "apparent the folly in any sane person trying to increase the volume of the gas at such an enormous loss of light, when the expense of keeping up the standard candle power, by supplying the additional carbon necessary, would quadruple the slight gain in volume as measured at the meter."

Mr. Whitley, the editor of the *Liverpool Journal* on testing the matter at the gas works, remarks (now it is plain to be seen, that if it was done at the gas works, it must have been tested by one of the small "meter provers" common at all works of any size, as it is not presumed they charged one of their large holders with 10 per cent. of air, for if they did so, they would at once admit the truth of the very charge sought to be against them, viz., introducing atmospheric air into the mains), that, in the experiment of the introduction of 10 per cent of air into the gas, the meter registers 10 per cent or more against the consumer—that is, in filling the former with 90 per cent. of gas, and 10 per cent of air, the meter measured 100 per cent as Mr. Muspratt asserted it would.

We now come to the assertion by Mr. Whitley (who we have no doubt was perfectly honest in the matter), which is in contradiction to your article. He says: "*Some* denied that gas so mixed with air would burn (without deterioration, *vide* Muspratt and yourselves), but the result shows that it does, and *had no effect visible to the eye*, which is an important fact."

You assert, on the contrary, (which we believe) "that 10 per cent. of air, as assumed, will so depreciate the illuminating power, that in the ordinary burner and at ordinary pressure, there will be a loss of 67 per cent. of the illuminating power of 12 candle gas."

If any are curious to test the air question, we can readily suggest a means by which they can be gratified. In the evening let the stop cock in the cellar be turned off, the meter be detached and taken down—blow into the meter—very gently if it is a dry meter, that all the gas that is in it may be expelled, then connect the meter and turn on the gas. We can guarantee every one full satisfaction in this experiment, and think they will be able to detect as the minutes pass, the rate of percentage, from air up to pure illuminating gas of 12 or 14 candle power; they can judge for themselves the relative amount of light at each stage of the process. We are confident after such trial, that people generally will coincide with you in opinion.

The question arises, how then was Mr. Whitley so deceived? Unfortunately we cannot test the matter not having the requisite machinery, but we are of the opinion that when certain proportions of atmospheric air and carburetted hydrogen are placed in the same vessel, there is but small combination or chemical affinity between them; that to effect a mixture agitation is necessary, as in the "Parrish Mixer," for rich petroleum gas, and no air test of its illuminating power can be made, until such mixture has been effected.

We suppose, as before stated, that in the experiment in Mr. Whitley's presence, the "meter power" or "gas holder" as he calls it, was on its base; that gas was introduced until it rose to 90 per cent, of its capacity; when it reached that point the inlet for air was opened and the "power" raised to the zero (0) mark. Now, in accordance with chemical law, "when gases unite merely in consequence of being brought into contact, without combustion, the volume of one being greater than its combining proportion, the excess remains pure and untouched."

In this case the carburetted hydrogen being in excess of its combining proportion, remains at the top of the power pure and unadulterated, consequently the "burner" being attached at that point, when lighted the gas would burn for a considerable time, as asserted by Mr. Whitley, so as to show "that it had *no effect* visible to the eye."

Supposing, however, Mr. Whitley's statement *be true*, we do not see the consumers need complain, for does he not plainly and unequivocally state, that the result showed that 10 per cent. of air does mix with gas, and in the act of combustion "*had no effect visible to the eye!*"

If such adulteration was practised it would be fraud,

especially if, as you show, it would deteriorate the light; consequently, if the consumer suspects such adulteration, below the standard of merchantable gas, all that would be necessary would be to test the gas by the process mentioned in the concluding extract from "Muspratt," by some competent chemist—the case taken into court—the company mulcted for heavy damages, and the injured citizens protected in their rights.

G. R.

PATENT CLAIMS.

Pertaining to Gas, Mining, Petroleum, Water etc.

FOR THE TWO WEEKS ENDING APRIL 2, 1867.

62,725—PORCELAIN GAS BURNER.—T. G. Arnold and Benjamin Irving, New York City.

We claim the making of a glazed porcelain burner, by perforating or slitting it after being glazed, for the purpose and in the manner substantially as herein set forth.

61,738—VACUUM PUMP.—Edward Dunscomb, Boston, Mass. Antedated February 28, 1867.

I claim the peculiar construction of the vacuum pump, j j, that is so composed of the vessels, n and o, and pipes h i K, with their stop-cocks, as to operate both as a vacuum pump and vapor receiver and storer, substantially as and in manner described.

62,749—ORE CONCENTRATOR.—Morgan Hungerford, San Francisco, Cal.

I claim, First—A pan cut in two and dropped about one inch, so that the lowest depression shall be two inches, more or less, below the ridge or angle of such concentrator, substantially as described and for the purpose set forth.

Second—The slots or outlets, F F, above the line of the groove around the inner rim, as described.

Third—The outer rim, G, with H H, also the discharge holes, J J, under the pan, around the said outer rim, substantially as described and for the purpose set forth.

62,795—CUT OFF VALVE GEAR OF STEAM ENGINE.—Walter Wright, Danvers Centre, Mass.

I claim the construction of each of the trapezoidal projections, l l, with offsets or steps as set forth to operate in combination with the arms, l m, and the two shafts, n o, arranged and connected in manner and to operate as described.

I also claim the combination and arrangement of the shafts, n o, the arms, l m and r, when arranged in manner and to operate with the trapzoidal projections, I I, fixed to the auxiliary valves, G H, applied to the main slide valve, F, as described.

62,823—MANUFACTURE OF GAS.—James Crutchett, Stroud, England.

First—I claim the manufacture of gas for lighting and heating purposes from pulverized or fine coal, or other carbonaceous materials injected into retorts or ovens, in small quantities, either by separate successive injections or in small continuous currents, as herein described.

Second—I claim the injection into retorts or suitable ovens or chambers, of pulverized, powdered or small coal, saw dust, oils, or carbonaceous materials, by means of steam supplied to such retorts in separate charges, or in continuous currents, as herein described.

Third—I claim the injection of suitable carbonaceous materials, as aforesaid, for the manufacture of gas into retorts, ovens or heated chambers by separate successive injections or currents, by means of compressed atmospheric air, compressed gas, springs or other mechanical means, as herein-before described, whether the interiors of such retorts be under a slight pressure or vacuum.

62,841—STEAM TRAP.—John Hague, Providence, R. I.

I claim the hollow valve stem, C, constructed and arranged substantially as described in combination with the air and water valves, B and E, and operated as set forth.

62,919—CONCENTRATING SULPHURIC ACID.—D. Ashworth and R. B. Eaton, Woburn, Mass. Antedated March 12, 1867.

First—We claim condensing or rectifying oil of vitriol by passing the same through a series of retorts, in combination with a heating apparatus, substantially as herein described.

Second—We claim the combination of a series of glass retorts, G, with the pan, E, substantially as and for the purpose set forth,

Mining Share Market.

The San Francisco Weekly Stock Circular of February 23d gives the market rates of mining stock as follows:

The mining share market has exhibited considerable life this week, large sales have been made, and for the most part prices have been well sustained. The inclemency of the weather has prevented the receipt of full advices from the mines, but so far as we can learn, no material change has taken place worthy of special notice.

HALE & NORCROSS—continues very firmly held, no public sales having been made during the past week; we learn, however, that one foot was privately disposed of at $3,000. At the close $2,900 is bid.

SAVAGE—sold at fluctuating rates, opening at $1,900, buyer, 3, declining to $1,800 @ 1,775, recovering to $1,900, and closing on Thursday at $1,870, seller, 30.

CROWN POINT—rose from $860 to $950, then sold at $880, and closed at $900. During the week ending the 15th instant, 847 tons of ore were raised; previous week, 897 tons.

YELLOW JACKET—steadily declined from $785, the closing price of last week, to $678 and $665, then rallied to $720, and closed on the 21st at $694.

GOULD & CURRY—has been in little request, selling at $545@550, receding to $515.50, and closed at $520.

CHOLLAR-POTOSI—was dealt in to a large extent at enhanced rates, advancing from $225 to $240, receding to $223, improving to $246, and closing at $350, seller 15. During the week ending Feb. 16th, 1,140 tons of ore were sent to custom mills, being 80 tons more than in the previous week.

OPHIR—has been in favor at an advance, selling within a range of $180@398, and closing at $220, seller, 30.

IMPERIAL—advanced from $170 to $185, and on Thursday $185 per share was bid. The receipts of bullion by this company up to the 17th instant amount to about $32,000.

EMPIRE—has been more freely dealt in, advancing from $180 to $190, and closing at $187.50, seller 30.

BELCHER—sold at $120, then at $117.50, and closed at $112.50....BULLION—receded from $19 to $13, and at the close sold at $17.

Useful Recipes.

DISCOLORATIONS of the face are generally produced by the accumulation of pigment under the cuticle, caused by indigestion. The trouble may be removed by dissolving half a teaspoonful of common salt in a tumbler full of water and drinking it every morning before breakfast.—*Druggists' Circular.*

A SUPERIOR GLUE—A very superior glue may be made by dissolving three parts of India-rubber in thirty-four parts of naptha. Heat and agitation will be required to readily effect the solution. When the rubber is completely dissolved add sixty-four parts of finely powdered shellac, which must also be heated in the mixture until all is dissolved. This mixture may be obtained in sheets like glue, by pouring it, when hot, upon plates of metal where it will harden. When required for use it may be simply heated in a pot till soft. Two pieces of wood or leather joined together with this glue can scarcely be sundered without a fracture or tearing of the parts.—*San Francisco Mining Press.*

WELDING COMPOSITION.—Mix borax with 1-16 of sal ammoniac, fuse the mixture, and pour it on an iron plate. When cold, pulverize it, and mix it with an equal weight of quick lime, sprinkle it on iron, which is heated to redness, and replace it in the fire. It may be welded below the usual heat.

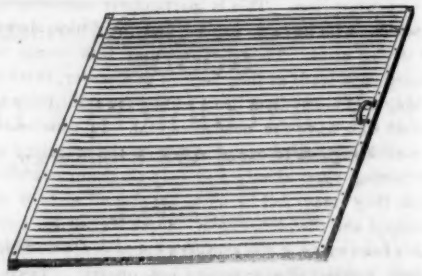
MODELING WAX.—This is made of white wax, which is melted and mixed with lard to make it malleable. In working it the tools and the boards or stone are moistened with water, to prevent its adhering; it may be colored to any desired tint with dry color.

GLAZES.—Common earthenware is glazed with a composition containing lead, on which account it is unfit for many pharmaceutical purposes. The following glaze has been proposed, among others, as a substitute: 100 parts of washed sand, 80 of purified potash, 10 of nitre, and 20 of slaked lime; all well mixed, and heated in a blacklead crucible, in a reverberatory furnace, till the mass flows into a clear glass. It is then reduced to powder. The good to be slightly burned, placed under water, and sprinkled with the powder.

SOLVENT FOR OLD PUTTY AND PAINT.—Soft soap mixed with solution of potash or caustic soda; or pearlash and slaked lime mixed with sufficient water to form a paste. Either of these laid on with a brush or rag and left for some hours, will render it easily removable.

SUPERINTENDENT.

PARTIES DESIROUS TO SECURE THE SERVICES of a SUPERINTENDENT of GAS and WATER WORKS who has had an experience of twenty years in the above business, and who can give the best of reference, can do so by applying soon by letter or otherwise, to the Editors of this Journal. 73



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WILLIAM HUMPHREYS,
*1f Supd't Gas Works, Waterford, N. Y.

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GAS STOVE MANUFACTURING COMPANY.

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Gas Stoves made by us are constructed under the immediate supervision of A. L. BOGART, Esq., Analytical Chemist and Gas Engineer. They contain recent improvements of a scientific character—by means of which a PERFECT COMBUSTION is obtained, and the Caloric produced, rendered CHEMICALLY PURE. Too much cannot be said against the use of Gas Stoves for heating apartments—when the products of combustion (Carbonic and Sulphurous Acids are emitted without purification into the atmosphere. Your Physicians will inform you, that this is a subject of vital importance) and worthy of your closest scrutiny—before purchasing. The public are invited to examine into the merits of these inventions.

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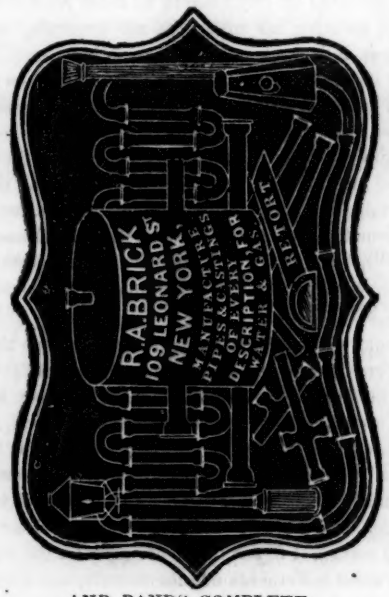

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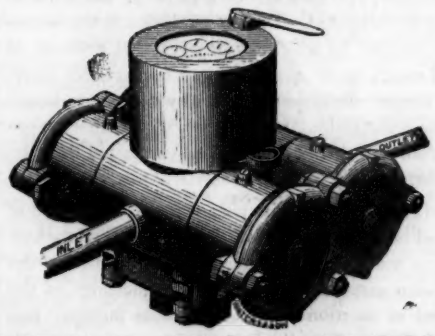

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ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

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It is entirely noiseless. A patented device prevents it being turned backward. The needle cannot be set wrong. It received the gold medal of the American Institute in 1863. Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

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Manufacturer, 508 Broadway, New York.

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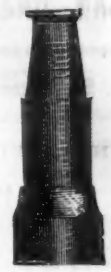
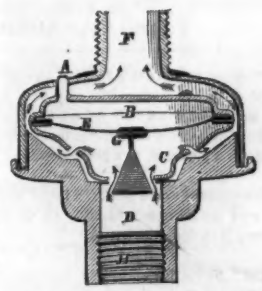
NOTICE

To Gas Companies and Gas Consumers.

THOMPSON'S GAS CONTROLLER.





The only perfect SELF-ACTING REGULATOR and burner combined ever invented or known to science.

This Automatic Gas Controller works upon a simple and well-known principle n Mechanics. The lower cut fully shows its construction. The conical valve at G is attached to the elastic diaphragm, E. As the gas enters in the direction as shown by the arrows, the diaphragm E is acted upon according to the pressure of the gas, and tends to close the valve upon its seat. The chamber, B, of the inner case communicates with the air by the orifice, (A). Hence the gas below the diaphragm is only balanced by the air above it and the valve falls or rises as the pressure varies, to regulate the admission of the gas, and consequently the pressure at the burner.

This Controller will save from 25 to 60 per cent. of gas according to the pressure in the mains, and gives a beautiful, steady light, at a minimum of cost.

Late improvements have made this Controller simple, durable, and an unrivalled gas economizer.

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C. H. SAND, Esq,	" Metropolitan Gas Co.,	"
J. H. ADAM, Esq.,	" New York Gas Co.,	"
PETER COOPER, Esq.	Cooper Institute,	"
JOHN A. DUFF, Esq.,	Olympic Theater,	"
GEO. H. KITCHEN,	Inspector of Gas Meters,	"
A. L. BOGART, Esq.,	Gas Engineer,	"
Col. J. A. SABBATON,	Engineer Man. Gas Co.,	"
Col. A. J. WHITE,	" Met. Gas Co.,	"
J. K. SIMPSON,	" Cooper Institute.	"

Persons interested are invited to call at the office, 22 Pine-str't where they can see the operation by pressure guage and test meters.

M. L. CALLENDER, Agent.
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THE

WASHINGTON MILL

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SILVER MINING COMPANY

OF ECHO DISTRICT, HUMBOLDT CO., NEVADA.

Capital Stock $300,000,

Issued for Mining Purposes.

60,000 Shares at Five Dollars each.

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☞ The mine of this company rapidly approaching that point of development which will necessitate the erection of a Mill, the Trustees are authorized to dispose of 10,000 shares of the reserve capital stock.

Mining & Petroleum Standard
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AMERICAN GAS-LIGHT JOURNAL,
Published on the 2d and 16th of Each Month
At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,
EDITORS AND PROPRIETORS.

Profs. PARTZ & BUCK, Consulting Chemists.

TUESDAY, APRIL 2, 1867.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

SUBSCRIBERS would confer a favor upon us by remitting CHECKS or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 119 and 121 Nassau street, New York, are agents for this Journal. Newsdealers will please send orders to them.

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Answers to Correspondents.

"W. H," N. Y. The Magnesium Manufacturing Company, of Boston, Mass., have an improved magnesium lamp, which is said to be very superior for photographic and other purposes.

"AP." Cal. We think your invention is valuable, and worthy of a patent. Iron pipes is the kind of pipes generally used. Vitrified clay pipes are also used.

"L. A." Ohio. A safety-burner to shut off the gas entirely, when a draft of air or change in the pressure at the gas works extinguishes the light when burning low, has not yet been invented that we are aware of Accidents often arise from this cause of a serious nature. There is certainly room for an invention of this character.

"GAS FITTER" Phila. Right angles in gas piping are more liable to condensation than curves. All pipes should be furnished with curves and bends, instead of elbow and T pieces. These forms are more pleasing to the eye also, and the pressure of the passing gas is more uniform and persistent, or less liable to diminution. Gas pipes should always have a slight inclination. The "soldering fluid" means the acid used by all plumbers, to cleanse the surfaces of the parts to be soldered.

LATEST FROM OIL CREEK, PA.—We clip the following from the *Petroleum Recorder* of Feb. 27th:

—A new well was struck about two weeks since on the lands, of the Pittsburgh and Cherry Run Oil Company, Upper Cherry Run. It is producing about sixty barrels per day, and is owned by the Pittsburgh and Cherry Run Oil Company.

—A new well was struck on Friday on Lease No. 45 of the Foster Farm. It is pumping about forty barrels per day, and the water is not yet exhausted. The working interest is mostly owned by Major E. Newton, O. D. Harrington and Marcus Bronson.

—On Bull Run (Patterson Farm) a thirty-barrel well has been achieved; the well was named "Balliett." Tuesday a fifty barrel well struck out on the same farm. The total production of Bull Run is five hundred barrels per day.

Lead Pipe—Poison.

While the Sanitary Committee of our city have been so assiduous in their responsible duties, we have regretted that they have not given more positive attention to the poisonous influence from the use of lead pipes, for conducting water and other fluids for domestic consumption. There was almost a necessity for their use until within a few years, but now scientific research and mechanical genius presents an article patented 1863, 1864 and 1865, combining *all* the advantages of the common lead pipe, and is a sure protection against poisonous or any other bad effects upon the passing liquid. Block tin is admitted by every one to be a safe conduit for liquids, inducing no impurities, nor imparting any injurious influences, chemical or otherwise. By most ingenious and powerful machinery—well worth observation by any mechanic or scientific man—a block tin pipe is encased within a lead pipe with the most perfect regularity in size and thickness to an indefinite length, and the cost of this most valuable pipe is less than five per cent. more than common lead pipe of the same strength. Messrs. Colwells, Shaw & Willard manufacture this article at their works, at the foot of Twenty-seventh street, North River, N. Y.

Should we stop here it would seem perhaps that we were merely giving a "newspaper puff" to some indifferent new invention, but it is not so, because we cannot be induced to praise anything, or any enterprise, in our Journal, which we do not *believe* to be worthy of it, and worthy the attention of the public. This subject commands our persevering attention, and we will not be satisfied until a law is passed making it *imperative* to use pipes for the supply of water and other liquids for domestic use, which are positively innoxious.

While it is generally known that lead pipes are poisonous, yet they are continued in use because they are tolerated. Did the public know the insidious manner in which by degrees this solution of lead enters into the system and *accumulates* there, the danger would be shunned as would an epidemic. Some constitutions may endure, while others more delicate will shrink and become exhausted from its action.

"Lead is soluble in pure water. A solution of "lead is highly poisonous. There are cases in which "pure water drawn through leaden pipes, or from "leaden cisterns, has carried a sufficiency of the "lead in solution to poison a whole family. Im- "pure water coats the lead in process of time with "a white film, with a carbonate ot the metal which "is insoluble, with exceptions; one being the pres- "ence of water containing carbonic acid. Such "water in passing through the carbonate of lead "takes up an equivalent of the same, which equiva- "lent may be sufficient to cause distinguishable "colic, or set up a non-traceable source of indispo- "sition through a whole family. How is it, after "all, some lead pipes do not poison water? It "arises from the fact that old age has wrought a "change for the better in their disposition, for when "water impregnated with sulphur salts has for a "long time passed through leaden pipes, or has long "acted on leaden cisterns, the lead becomes coated "with a sulphate or a sulphide, and sulphide of lead "being perfectly insoluble in pure water, and "equally so in water not too excessively charged "with foreign matters to be potable, renders the "leaden vehicle perfectly harmless, and thus perfects "it for the duties which, in all other respects, it "performs in such an utilitarian manner. But we "have a moral to append to our subject. Are we "to wait content to be poisoned until our pipes be- "comes transmuted, or what are we to do?" See AMERICAN GAS-LIGHT JOURNAL, October 15, 1863, from the London *Builder*.

"I have often detected this metal (lead) in Cro- "ton water that has passed through leaden pipes. "Even *water* containing earthy salts will dissolve "enough of that poisonous substance to injure *the* "*health*. The happy combination of a tube of pure "block tin encased in a thick covering of lead, gives "us the flexibility and toughness with the facility "of making joints afforded by the latter metal, with "the strength and power of resisting corrosion, by "the ordinary impurities of drinking water that are "the qualities of tin." Professor John Torrey.

"That water is poisoned by being brought in "contact with lead, has been known for several "thousand years.

"Vitravius, a Roman architect, who flourished in "the time of Julius Cæsar, B. C. 46, forbade its use "for this reason.

"The illustrious Galen, A. D. 130, condemned "lead pipe for conducting drinking water,

"At Haarlem, in Holland, when *lead* was substi- "tuted for *tiles* on the roofs of the houses, lead poi- "soning raged with great violence."

"Water contained in leaden cisterns, or in tanks "with cases of lead, or even passed through leaden "pipes, becomes impregnated to a greater or lesser "extent with injurious compounds of this metal.

"The *purest distilled water*, when in contact with "lead in the presence of air, forms the hydrated ox- "ide of this metal, which is soluble; the carbonic "acid of the atmosphere gradually precipitate this "into the oxy-carbonate, *which, however, is re-dis-* "*solved* by an excess of carbonic acid.

"Rain water may in this manner become poison- "ous, when falling on, or when received in vessels "of lead.

"Spring water containing chlorides and nitrates "will act still more readily upon this metal.

"Since all water contains this gas (carbonic acid) "to a greater or less extent, the conclusion is there- "fore inevitable that *there is no safety in using lead* "*for holding or conveying water which is to be intro-* "*duced into the human system.*" Professor R. Ogden Doremus, M. D.

"I find when the Croton water stands in the lead "pipes for some hours, that by chemical analysis the "water always shows the presence of lead. Such "water is very injurious to health. Beer, lager "beer, root beer, cider and soda water drawn "through a lead pipe, will always show the presence "of lead, and frequently become exceedingly inju- "rious." Samuel R Percy, M. D.

We make the above quotations from scientific men well known to the public, and every chemist, every physician endorses them as facts. Will the public be longer dormant and apathetic, and permit these "SILENT POISONERS" to continue their insidious and accumulative hold upon us? If so, legislative action should be had and enforce by law what individuals neglect.

Steel Rails.

We were much interested in the examination of a steel rail, of peculiar form, now in the office of S. A. Beers, Consulting Engineer, 24 Pine street, in this city.

This rail embodies some new principles of the utmost importance to railroad interests, and therefore will well repay a visit and examination by every railroad manager in the country.

By the substitution of a peculiar form of rail, or templet, the *lateral strength* of the rail is enlisted and made to carry a portion of the weight of train, which is clearly a new element of strength, as all other rails of whatever form, depend entirely upon their vertical, or perpendicular strength.

The practical effect, therefore, is to throw fully thirty per cent. of the strain upon the *lateral strength* of this rail, while the vertical strength remains untaxed, and its ultimate tenacity sensibly increased, by distributing the effects of deflection along the line, from a focal point, to which it must converge by the deflection of any vertical rail.

This important principle appears to be destined to settle satisfactorily the important question of the relative economy of iron and steel for rails; as by this plan a steel rail of 42 lbs. per yard is found to be fully equal in strength to 60 lbs. in the form of the T rail, when the relative cost of the iron rail of 60 lbs. and the equivalent steel rail of 42 lbs. would be as follows, for one mile of single track:

94½ tons of iron at $85 . . .	$8,011
66 tons steel rail at $150 . . .	9,900
Increase in first cost . . .	$1,889

which is less than 24 per cent. advance upon the cost of an iron track, which, from well authenticated experience, will outwear the iron more than ten fold.

In the State of New York, all companies organized under the general Railroad Act are prohibited from laying down any *iron rail* of less weight than 56 lbs., and as the 35 lbs. steel rail of this pattern is amply sufficient for the use of locomotives of 18 tons weight, it follows that a steel track can be adopted on all roads thus situated, with all its advantages, for less than 10 per cent. advance above the cost of the iron track, and thereby more than double the dividends in perpetuity.

It is also evident that the power of vibration possessed by this rail upon the principle of a semi-scroll, will absorb much of the strain thrown upon the equipment by oscillation, thus increasing the durability of both the train and rail.

New Water and Sewerage Pipes.

All who desire to use or drink pure water (and in these excise times most people are obliged to use a substitute of this kind part of the time at at least) cannot fail to appreciate the excellent invention of Messrs. Knight & Bailey, to produce piping and material for hydraulic purposes, having an external and internal appearance of stone or cement, similar in character to the famous Roman cement, which was used in building those wonderful conduits or aqueducts which circumscribed mountains, and spanned valleys and rivers, to convey the pure water of the Anio; to supply the Eternal City, when in its primitive glory. This cement has stood the test of 3,000 years, many portions of those splendid specimens of hydraulic engineering and architectural skill, being apparently in as good condition now as ever.

This patent material is superior to the Roman cement, inasmuch as its strength and durability is much increased by iron. The pipe in section represents a thin tube of wrought iron, with an external and internal lining of cement, having the appearance and character of stone. This kind of piping is becoming very popular, owing to its cheapness and durability, and is being sought after and adopted by the water companies and others throughout the United States.

The advertisement of the American Water and Gas Pipe Company, corner Green and Bay Streets, Jersey City, may be found in another column.

☞ We desire to direct the attention of gas manufacturers and engineers to the letter under the head of "Correspondence," refering to the new invention for detaching carbon from retorts. This is a very important invention or discovery in gas making. The inventor asserts that it adds twenty-five per cent. to the life of the retort, because it is not injured by the removal of the carbon, and saves the delay in the ordinary process of "burning out," which often takes twenty-four hours, at a considerable cost.

Most retorts require six burnings per annum; the cost of burning out a bench of five retorts, at a moderate estimate, would be about six dollars each burning, or thirty-six dollars per annum.

Clay retorts require renewal once in eighteen to twenty-four months on an average. If this process increases the life of a retort twenty-five per cent. as the inventor asserts, then the saving on a bench of five retorts would be about $25 or $30 per annum, making a total saving of over $60 per annum for each bench of five retorts. This invention, therefore, shows an important item of economy, deserving the attention of all gas men.

THE DRUGGISTS' CIRCULAR AND CHEMICAL GAZETTE.—We have no more acceptable and valuable exchange than this Journal. It is a practical Journal of Chemistry as applied to Pharmacy, Arts and Sciences, and general business organ for Druggists, Chemists and Apothecaries.

Each number contains a great amount and variety of valuable information appertaining to its specialties, which is indicative of much enterprise, energy and talent in its editorial management. Judging from its well filled advertising columns, its patrons appreciate it highly as an advertising medium.

The *advertising index* to the Druggists' Circular is an excellent plan for convenience. Another peculiar and excellent feature in this Journal is the published list of exchanges received.

L. V. Newton, M. D., well and favorably known in his professional capacity, and to the public as a writer of ability, is editor and proprietor of this Journal.

TIEMANN'S

LAUNDRY BLUE.

FOR

FAMILY USE.

This BLUE is perfectly Pure and free from Acid, rendering it a Superior article.

J. H TIEMANN, Agent,
240 Pearl street, New York.

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CLEGG'S PRACTICAL TREATISE ON THE MANUFACTURE and DISTRIBUTION OF COAL GAS, 4 to. cloth, $10 50.

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THE GAS WORKS OF LONDON. By Zerah Colburn. 75c.

THE GAS CONSUMERS' GUIDE. 50c.

GAS WORKS and MANUFACTURING OF COAL GAS. By S. Hughes: 12mo. $1 50.

For sale by

D. VAN NOSTRAND,
174 Publisher and Importer, 192 Broadway.

PROPOSALS FOR THE CONSTRUCTION OF THE SUMMIT DIVISION OF THE ILLINOIS AND MICHIGAN CANAL.

OFFICE OF THE BOARD OF PUBLIC WORKS,
CHICAGO, March 18th, 1867.

Sealed Proposals will be received by the Board of Public Works at their office, until 11 A. M. Wednesday, May 1st, 1867, for the excavation necessary to deepen the Illinois and Michigan Canal, according to the plan adopted, from Chicago River to Summit Lock, No. (2) two, a distance of twenty-six (26) miles.

Maps, profiles, specifications, etc., will be exhibited at the office of the Board of Public Works in Chicago, on and after April 15th until the day of letting.

There will be some two millions (2,000,000) cubic yards of earth excavation—some of it quite hard and embracing considerable detached rock—and about four hundred seventy thousand (470,000) cubic yards of stratified limestone.

The work must be prosecuted so as not to interfere with the use of the Canal during the season of navigation.

It is believed, however, that the most of the excavation, except the stratified rock, can be done with steam dredges without interfering with the navigation of the Canal, but the rock excavation will all have to be done between the close of navigation in the fall and the opening in the spring.

If a new line be adopted for any portion of the distance, operations thereon may be continued the whole year; and the navigation of the Canal will be suspended at least five months in each year, unless otherwise mutually agreed by the Board and Contractors.

The whole of the work must be done on or before the end of the third season of the suspension of navigation.

A large amount of machinery will be required to excavate the work within the time required, consisting mainly of steam dredges, scows and cranes for the earth work, and drilling machines, pumping machinery and cranes for the rock.

Contractors will be required to commence work on the earth excavation within thirty days of the time of letting, and upon rock excavation by the 1st of November next.

The dredges, cranes and scows now in the Canal can be had at an appraised value, which will be made known to bidders prior to the letting.

Parties contracting for the work will be required to provide all machinery, and to put up and remove all dams and all works of protection, and at their own expense to do all pumping, or whatever may be necessary to secure their work from water.

Proposals must be addressed to the Board of Public Works, endorsed "Proposals for Deepening Illinois and Michigan Canal," and be accompanied with the usual two hundred dollar ($200) bond, with sureties, to be approved by the Board.

Contractors will bid, stating the price for which the work will be done on each of the different sections, and the work will be let as a whole or in part, and in such quantities as the Board shall determine.

The Board reserve the right to reject any and all bids, and no proposal will be accepted unless the party offering it shall give evidence satisfactory to the Board that he has the necessary skill, experience, energy and ability for doing the work, is trustworthy, and has sufficient pecuniary resources.

The Board will require such security as, according to their judgment, will secure the doing of the work according to the contract.

J. G. GINDELE,
FRED. LETZ,
O. J. ROSE,
WILLIAM GOODING,
R. M. MASON,
Board of Public Works.

75-3t

BROOKLYN TUBE WORKS.

B. T. BENTON,

MANUFACTURER OF

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TUBES,

For Steam, Water, or Gas.

MANUFACTORY AND OFFICE,

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J. S. PHILLIPS, C. E. M.,

MINING ENGINEER, Etc.,

from Cornwall, who came to work Ledges for a New York Company at Humboldt, Nevada, is free for Examination or Superintendence of Mines, in consequence of his immediate condemnation and abandonment of those operations.

REFERENCES:—Messrs. Daniels, Crozier, Coe, & Co., Bankers, etc., 22 Nassau street, New York. Orders by Telegram, Humboldt City, Nevada. n74-3t

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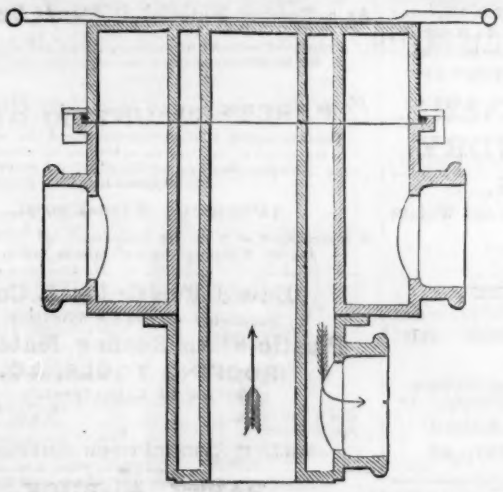

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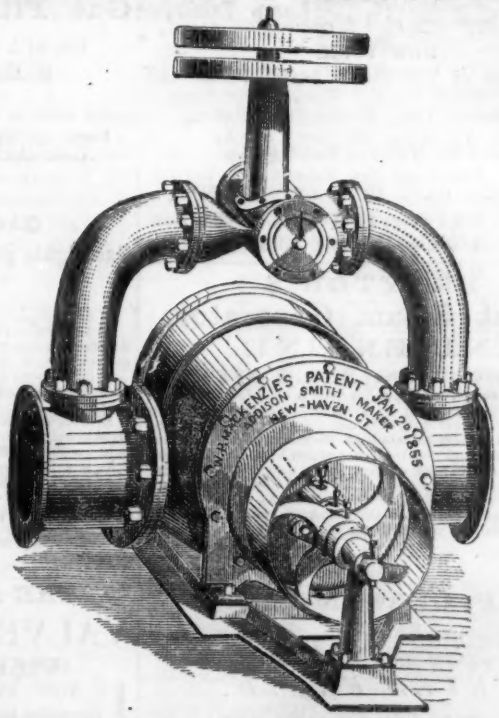

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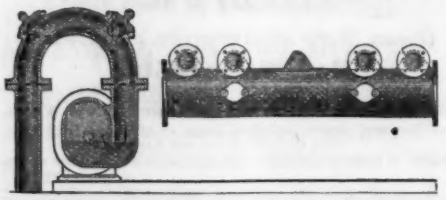

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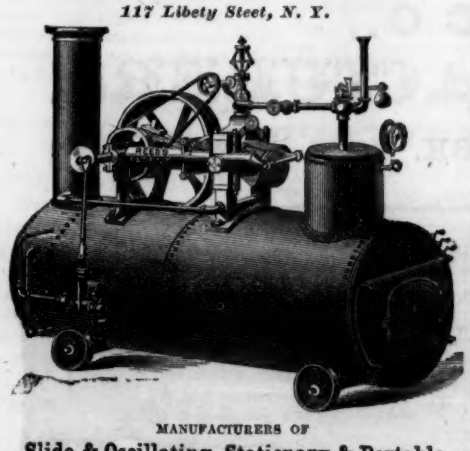
CIRCULAR SAWS.

53-76

REED & COGSWELL,

CONSULTING ENGINERES,

117 Libety Steet, N. Y.



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Slide & Oscillating, Stationary & Portable

ENGINES,

Of all sizes. Also furnish all kinds of MACHINERY, TOOLS, AND GENERAL SUPPLY. Drawings of all kinds of Machinery executed to order.

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Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M LESLEY,

Manufacturers, No. 605 Sixth Ave., New York.

Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufactu rer,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

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Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,
137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency 389 Broadway, N. Y.

Below we give a few prices:

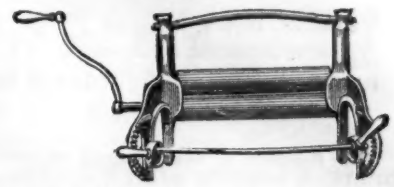
No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil-Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

WEED SEWING MACHINE Co.,
136, 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*
That a *simple* machine is better than a complicated one.
That a Wringer should be *self-adjusting, durable, and efficient.*
That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.
That wood soaked in water will *swell, shrink,* and *split.*
That wood-bearings for the shaft to run in *will wear out.*
That the Putnam Wringer, with or without cog wheels, will *no tear the clothes.*
That cog-wheel regulators are not essential.
That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.
That all who have tried it pronounce it the *best* Wringer ever made.
That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,
13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

C. GEFRORER,

MANUFACTURER OF

Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.

Burners for Wood, Coal Oil and Water Gas.

Gas and Lava Burner Tips

Constantly on Hand

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishment, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by

HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.

John C. Cresson, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of workmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. Hookey, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, Birkinbine & Mears.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufactur in the United States. Respectfully Yours George Wiegand, Inspector of Gas Fittings, Philadelphia

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.

Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

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PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano-Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES!

No. 1,	Seven Octave, round corners, Rosewood,	Plain Case,	$275
No. 2,	" " "	Heavy Moulding	300
No. 3,	" " "	Louis XIV style	325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds. Descriptive circular sent free on application.

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PASCAL IRON WORKS

[ESTABLISHED 1821,]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

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MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Line Sleeves for Purifiers, Hoisting Machines for Lifting Purifier Covers.

Address— MERRICK & SONS,
5th and Washington Sts, Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co..)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

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TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its banches

561 Broadway,
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THE WOODWARD
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MNUFACTURERS OF THE WOODWARD PATENT IMPROVED

SAFETY STEAM PUMP,

—Adapted for Mining and Fire Purposes—and
Steam, Water & Gas Fittings of All Kinds.

Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,

Woodward Building, 76 and 78 Centre Street,

corner of Worth street, *New York.*
Formerly 77 Beekman Street,
53 GEO. M. WOODWARD, Pres't. 64

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
Wet and Dry Gas Meters,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

THE AUBIN BALLANCED
VALVE WATER METER,
(Used also for Oils and Liquors)

Is now in use by many City Water Cos., because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

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MANUFACTURERS OF
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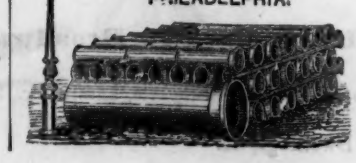

Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salsroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbers.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,
COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,

IMPORTERS AND

SOLE AGENTS

For the United States and Canada, of

SCHWARZ'S

GERMAN LAVA GAS-TIPS

And proprietors of Winchester's Improved

LAVA TIP GAS BURNERS,

No. 25 Kilby Street,

BOSTON, MASS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS,
And Importer of SCOTCH TIPS,
224 and 226 West 21st street,
formerly No. 447 BROOME ST., New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' ROVING APPARATUS, &c.
529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,
Sole Agent for the sale of
Thompson's Gas Controller
in the States of
CALIFORNIA AND OREGON,
San Francisco, Cal.

Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
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Estabi shed 1854.

Purchases to order any article wanted from New York, or Europe, for ladies' or gentlemen's use or wear,---comfort or luxury,---from a cameo to a cashmer, a seal ring to a steam engine.

Goods purchased at current City prices, and forwarded by Express or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA
MEXICAN & BRAZILIAN
EXPRESS.

CARRINGTON & CO.
30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S
New Family
SEWING MACHINE
Should be known in
IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the FINKLE & LYON FAMILY SEWING MACHINE to any other, he can return it and have back his money.

This machine has taken many of the HIGHEST PRIZES; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
No. 561 BROADWAY, NEW YORK.

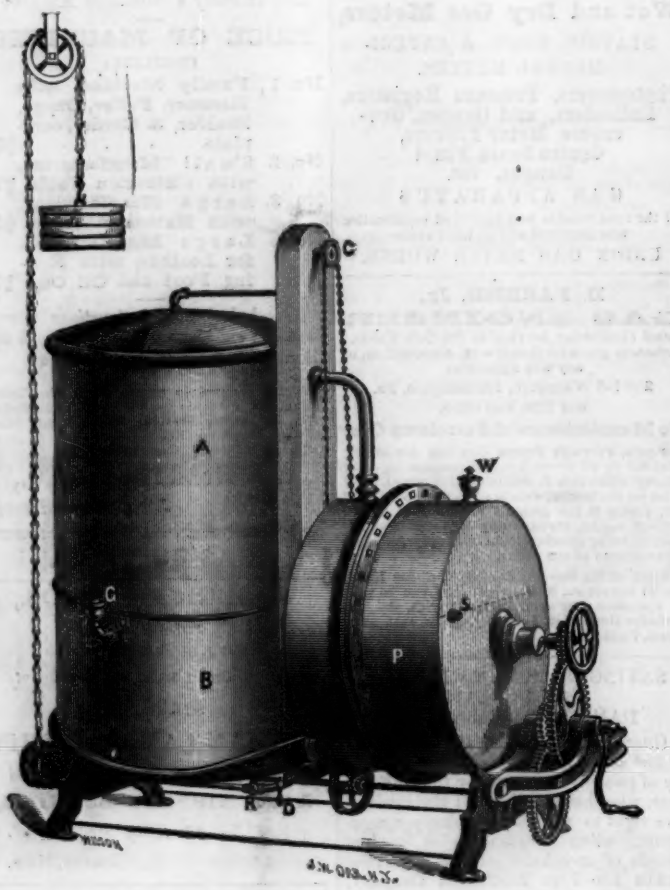
EMPIRE STATE GAS MACHINE,

LEVI STEVENS' PATENT, FOR SUPPLYING,

Dwellings. Stores, Factories and Public Buildings.

THE GAS GENERATED BY THIS MACHINE

Is a mixture of the vapor of hydro-carbon with common air. The mechanical devices employed are such as, from a long experience and critical examination into the nature of the element brought into use, scam best adapted to secure a certain and satisfactory result. GASOLINE, the liquid employed, is the more volatile portions of Petroleum, of a specific gravity of 0.6387. This liquid exposed to the action of this machine is vaporized, and a close mechanical mixture of the vapor with common air is effected. The value of the gas produced, its permaneney, its illuminating quality, and freedom from liability to condensation, depend almost entirely upon the perfect and uniform character of this mixture. Hence the great importance of mechanical means adapted to secure all the conditions requisite in a Portable Gas Machine.



THE PRICE-LISTS OF MACHINES COMPLETE;

(Boxed and delivered on the cars at the Manufactory.)

No. 1,	$150,	5 Argand Burners.	
do. 2,	250,	10	do.
do. 3,	350,	20	do.
do. 4,	450,	35	do.
do. 5,	600,	60	do.
do. 6,	1,000,	125	do.
do. 7,	1,500,	250	do.

This machine will produce the most brilliant and steady light without Fire or Heat, and is warranted to operate in every respect as represented.

The EMPIRE STATE GAS MACHINE is the most SIMPLE and EFFECTIVE MEANS KNOWN FOR PRODUCING GAS WITHOUT HEAT.

Its action is automatic, feeding itself with constant supplies of Gasoline, thus securing steady and uniform supplies of Gas. The gas produced is equal to the best known Illuminating Gas. It is as economical as any other, and is adapted to a wider range of use for Lighting, Heatin and Mechanical purposes. It will maintain its illuminating power under as great a degree of cold as any other. It is free from danger with the ordinary care in using gas. Its remarkably pure and steady light is pleasant for the eye. It renders it easy for persons living remote from street gas pipes to enjoy the luxury of a pure GAS-LIGHT, at a COMPARATIVELY SMALL COST, AND WITH LITTLE TROUBLE.

☞ The public are invited to witness its operations at our store. GASOLINE will be supplied by us, at market prices, or may be obtained from the various other sources of supply now going into operation.

MITCHELL, VANCE & Co., 620 Broadway, New York,

Manufacturers of Chandeliers and Gas Fixtures of every description. Also Chandeliers, Brackets, Lamps, &c., for Coal Oil, adapted to Churches, Public Buildings, Dwellings, &c.